Polarographic Catalytic Hydrogen Waves Caused by Organic Catalysts. I. Exact Solution of the Problem for the Case of a Bimolecular Regeneration of the Inactive Form of the Depolarizer From the Products of Electrode Reaction, and of a Monomolecular Conversion of the Depolarizer to Its Active Form

S/076/60/034/03/025/038
B005/B016

($t_s \ll t_1$), in which the concentrations of the substances A and B are equal to the initial concentrations owing to the assumed rapid regeneration of the depolarizer from the products of depolarization. It follows that the diffusion of the depolarizer from the solution to the electrode does not affect the electrode process, and that current density does not depend on time, accordingly. This means for a dropping electrode that the mean current density is independent of the depth of the reservoir and is, at the same time, proportional to $t_1^{2/3}$. On the basis of these assumptions the authors derived the equations for the mean polarographic current densities by means of an exact method. The derivation is given and explained in detail. There are 2 figures and 8 references, 1 of which is Soviet.

ASSOCIATION: Chekhoslovatskaya Akademiya nauk Institut fizicheskoy khimii (Czechoslovakian Academy of Sciences, Institute of Physical Chemistry). Akademiya nauk SSSR Institut organicheskoy khimii im. N. D. Zelinskogo (Academy of Sciences, USSR, Institute of Organic Chemistry imeni N. D. Zelinskiy)

SUBMITTED: February 10, 1959

Card 3/3

Z/009/61/000/007/003/004
E112/E135

AUTHORS: Dolejšek, Z., Grubner, O., Hála, E., Hanuš, V., and Kossler, I.

TITLE: Contribution to the purification and analysis of isoprene. II.

PERIODICAL: Chemický průmysl, 1961, No.7, pp. 361-363

TEXT: The production of polyisoprene requires the use of a monomer of highest purity. Distillation methods are suggested for the isolation of isoprene; it is stated that recovery processes will be successful if based on a thorough knowledge of vapor-liquid equilibrium data of the main components of technical isoprene. The present paper describes the determination of equilibrium data for mixtures of 2-methylbutene-1 (component 1), isoprene (component 2) and 2-methylbutene-2 (component 3). The above components were first purified and their mixtures then studied in a modified vapor-liquid equilibrium still, developed originally by D.T.C. Gillespie (Ref.2: Ind.Eng.Chem. A.E., 18, 575 (1946). A diagram of the apparatus is shown in Fig.1 and the experimental procedure is described. (A - inlet tube, C - Cottrell pump,

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Z/009/61/000/007/003/004
E112/E135

Contribution to the purification and analysis of isoprene. II.

E - equilibrium chamber, CH - condenser, K, P - sample chambers, R - disengagement chamber, V - boiler). In operation, sample chambers K, P and boiler V are filled with a measured quantity of the hydrocarbon mixture and the boiling rate adjusted so as to maintain the steady pumping of liquid and vapour through the Cottrell tube. After allowing sufficient time of operation to ensure steady conditions within the apparatus, samples of the boiling liquid and condensed vapour are withdrawn from chambers K and P by means of a cooled syringe and collected in glass ampoules for analysis. Analytical data are tabulated which enable the calculation of the correlation between relative volatility and composition of the liquid phase. The equation for a binary system is as follows:

$$a_{12} = \frac{y_1}{x_1}\frac{x_2}{y_2} = \frac{1 + 0.102\ x_2}{1 - 0.093\ x_1} \qquad (1)$$

$$a_{13} = \frac{y_1}{x_1}\frac{x_3}{y_3} = \frac{1 + 0.410\ x_3}{1 - 0.291\ x_1} \qquad (2)$$

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Contribution to the purification and analysis of isoprene. II.

$$a_{23} = \frac{y_2}{x_2}\frac{x_3}{y_3} = \frac{1 + 0.180\ x_3}{1 - 0.083\ x_2} \qquad (3)$$

where: x_1, x_2, x_3 are molar fractions of components 1, 2 and 3 in the liquid phase; y_1, y_2, y_3 are molar fractions of components 1, 2 and 3 in the vapour phase; and a_{12}, a_{13}, a_{23} the relative volatilities of the subscript components. Ternary systems follow the following equations:

$$a_{13} = \frac{y_1}{x_1}\frac{x_3}{y_3} = \frac{1 + 0.410\ x_3 + 0.102\ x_2}{1 - 0.291\ x_1 - 0.083\ x_2} \qquad (4)$$

$$a_{23} = \frac{y_2}{x_2}\frac{x_3}{y_3} = \frac{1 + 0.180\ x_3 - 0.093\ x_1}{1 - 0.083\ x_2 - 0.291\ x_1} \qquad (5)$$

The composition of the gaseous phase in equilibrium can be computed from the composition of the liquid phase by equations:

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E112/E135

Contribution to the purification and analysis of isoprene. II.

$$y_1 = \frac{a_{13}\frac{x_1}{x_3}}{1 + a_{13}\frac{x_1}{x_3} + a_{23}\frac{x_2}{x_3}} \quad (6)$$

$$y_2 = \frac{a_{13}\,(x_2/x_3)}{1 + a_{13}\frac{x_1}{x_3} + a_{23}\frac{x_2}{x_3}} \quad (7)$$

$$y_3 = 1 - y_1 - y_2 \quad (8)$$

The authors conclude from Eqs. (1) to (5) that binary or ternary azeotropes are absent from the system isoprene : 2-methylbutene-1 and 2-methylbutene-2, although this is in disagreement with the finding of M. Lecat (Ref.7: Ann. Soc. Sci. Bruxelles, 63, 58 (1949). The validity of the findings of the Czechoslovak authors was confirmed by practical distillation results, which will be utilized

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Z/009/61/000/007/003/004
E112/E135

Contribution to the purification and analysis of isoprene. II.

for the study of the economics of industrial isoprene recovery for the production of synthetic rubber.
There are 1 figure (diagram of Gillespie apparatus), 2 tables (results of analyses) and 9 references: 6 Czech, 2 English and 1 French. The English language references read as follows:
Ref.2: D.T.C. Gillespie, Ind.Eng.Chem. A.E., 18, 575 (1946).
Ref.8: L.H. Horsley, Azeotropic data. Washington, 1954, No.7837.

ASSOCIATION: Ústav fyzikální chemie Československé akademie věd, Praha
(Institute of Physical Chemistry, Czechoslovak AS, Prague)

SUBMITTED: November 14, 1960

Card 5/6

MOZA, B.K.; TROJANEK, J.; HANUS, V.; DOLEJS, L.

On alkaloids. Pt. 13. Coll Cz chem 29 no.8:1913-1921 Ag '64.

1. Research Institute for Natural Drugs, Prague, Institute of Physical Chemistry, and Institute of Organic Chemistry and Biochemistry, Czechoslovak Academy of Sciences, Prague.

TROJANEK, J.; STROUF, O.; BLAHA, K.; DOLEJS, L.; HANUS, V.

On alkaloids. Pt. 12. Coll Cz chem 29 no.8:1904-1912 Ag '64.

1. Research Institute for Natural Drugs, Prague, Institute of Organic Chemistry and Biochemistry, and Institute of Physical Chemistry, Czechoslovak Academy of Sciences, Prague.

DOLEJS, L.; HANUS, V.; SLAVIK, J.

A mass spectrometric study of protopine alkaloids. Coll Cz Chem 29 no.10:2479-2483 O '64.

1. Institute of Organic Chemistry and Biochemistry, Institute of Physical Chemistry, Czechoslovak Academy of Sciences, Prague, and Department of Chemistry, Faculty of Medicine, Purkyne University, Brno.

CERMAK, V.; HANUS, V.; HLADEK, L.; HERMAN, Z.; PACAK, M.; SCHULZ, L.

A mass spectrometer for precise determination of the ratio of deuterium to hydrogen in hydrogen gas in the region of natural deuterium concentrations. Coll Cz Chem 27 no.7:1633-1638 Jl '62.

1. Institute of Physical chemistry, Czechoslovak Academy of Sciences, Prague.

HANUS, V

Z

CZECHOSLOVAKIA

DOLEJS, L; HANUS, V; CERNY, V; SORM, F.

1. Institute of Organic Chemistry and Biochemistry; 2. Institute of Physical Chemistry of the Czechoslovak Academy of Sicences, Prague (for all)

Prague, Collection of Czechoslovak Chemical Communications, No 6, 1963, pp 1584-1591

"On Steroids. LXXVIII. Mass Spectra of Holarrhena Alkaloids."

DUSKOVA, L.; GRUBNER, O.; HANUS, V.; KOSSLER, I.; MATYSKA, B.

Selection of extraction agents for isoprene rectification. Chem prum 13 no.10:513-516 O '63.

1. Ustav fyzikalni chemie, Ceskoslovenska akademie ved, Praha.

HANUS, V., promovany ekonom

Main trends in the improvement of work organization in industrial enterprises. Pod org 17 no. 12: 565 D '63.

HANUS, V.; DOLEJSEK, Z.

Some experimental data related to theories of mass spectra origin. Coll Cz Chem 28 no.3:652-658 Mr '63.

1. Institute of Physical Chemistry, Czechoslovak Academy of Sciences, Prague.

DOLEJS, L.; HANUS, V.

"Mass spectrometry; organic chemical applications" by Klaus Biemann. Reviewed by L.Dolejs, V.Hanus. Chem listy 57 no.9:987 S '63.

HANUS, Vaclav

Zonal structures of products of hydrothermal metasomatism.
Rozpravy mat. CSAV. 73 no.1:3-52 '63.

1. Central Geological Survey, Praha.

GANUSH, V. [Hanus, V.]; MAYRANOVSKIY, S.G.; KOUTETSKIY, Ya. [Koutecky, J.]

Polarographic catalytic hydrogen waves produced by organic catalysts. Part 2. Zhur. fiz. khim. 36 no.9:2010-2107 S '62. (MIRA 17:6)

1. Akademiya nauk Chekhoslovakii, Institut fizicheskoy khimii AN SSSR i Institut organicheskoy khimii imeni N.D. Zelinskogo.

DOLEJS, L.; HANUS, V.; CERNY, V.; SORM, F.

On steroids. Pt. 78. Coll Cz Chem 28 no.6:1584-1592 Je '63.

1. Institute of Organic Chemistry and Biochemisty and Institute of Physical Chemistry, Czechoslovak Academy of Sciences, Prague.

SANTAVY, F.; KAUL, J.L.; HRUBAN, L.; DOLEJS, L.; HANUS, V.; BLAHA, K.

Constitution of rhoeadine and isorhoeadine. Coll Cz Chem 30 no.1:335-338 Ja '65.

1. Chemical Institute of the Medical Faculty of Palacky University, Olomouc (for Santavy, Kaul and Hruban). 2. Institute of Organic Chemistry and Biochemistry of the Czechoslovak Academy of Sciences, Prague (for Dolejs and Blaha). 3. Institute of Physical Chemistry of the Czechoslovak Academy of Sciences, Prague (for Hanus). Submitted July 22, 1964.

CZECHOSLOVAKIA

VOTICKY, Z.; TOMKO, J.; DOLEJS, L.; HANUS, V.

1. Chemical Institute, Slovak Academy of Sciences, Department of Alkaloids, Bratislava - (for Votícky and Tomko), 2. Institute of Organic Chemistry and Biochemistry, Czechoslovak Academy of Sciences, Prague, (for Dolejs); 3. Institute of Physical Chemistry, Czechoslovak Academy of Sciences, Prague (for Hanus).

Prague, Collection of Czechoslovak Chemical Communications, pp 3705-3710.

"Alkaloids from Buxus sempervirens L. Part 4: The structure of buxtauine."

CZECHOSLOVAKIA

DOLEJSEK, Z.; HALA, S.; HANUS, V.; LANDA, S.

1. Institute of Physical Chemistry, Czechoslovak Academy of Sciences (for Dolejsek and ?); 2. Laboratory of Synthetic Fuel and Oil, Prague (for Landa? and ?)

Prague, Collection of Czechoslovak Chemical Communications, No 2, Feb 1966, pp 435-449

"Adamantane and its derivatives. Part 8: Mass spectra of derivatives of adamantane formed by substitution at $C_{(1)}$."

(1)

CZECH SLOVAKIA

SANTAVY, F; KAUL, J. L; HRUBAN, L; DOLEJS, L; HANUS, V; BLAHA, K; CROSS, A.D.

1. Chemical Institute of the Medical Faculty of Palacky University, Olomouc (for Santavy, Kaul, Hruban); 2. Institute of Organic Chemistry and Biochemistry, Prague (for Dolejs, Blaha); 3. Institute of Physical Chemistry of the Czechoslovak Academy of Sciences, Prague (for Hanus); 4. Syntex Research Center, Palo Alto, California, U.S.A. (for Cross)

Prague, Collection of Czechoslovak Chemical Communications, No 10, 1965, pp 3479-3499

"Constitution of Rhoeadine and Isorhoeadine."

GANUSH, V. [Hanus, V.]; DOLEYSH, L. [Dolejs, L.]; SHUL'TS, L.

Filling system for measuring the mass spectra of nonvolatile organic compounds. Prib. i tekh. eksp. 9 no.1:215-217 Ja-F '64. (MIRA 17:4)

1. Institut fizicheskoy khimii i Institut organicheskoy khimii i biokhimii Akademii nauk Chekhoslovatskoy Sotsialisticheskoy Respubliki, Praga.

CHRBOLKA, Jaroslav; HANUS, Vaclav

Advantages and shortcomings of flow production. Podn org 18 no. 3:106-111 Mr '64.

1. Institute of State Economic and Organizational Research Institute of the Consumer Goods Industry (for Chrbolka).
2. Higher School of Economics, Prague (for Haunus).

HANUS, W.

Mathematical Review
June 1954
Mathematical Physics

Hanus, W., and Rayski, J. Vacuum polarization in a non-local electrodynamics. Acta Phys. Polonica 12; 181–193 (1953). (Russian summary)

The authors calculate by perturbation theory the vacuum polarization produced by an external source of current, in the non-local electrodynamics of J. Rayski [Proc. Phys. Soc. Sect. A. 64, 957–968 (1951); these Rev. 13, 609]. They find (i) a non-gauge-invariant term corresponding to a large finite self-energy for the photon, (ii) a finite charge-renormalization term, and (iii) other finite terms representing observable polarization effects. These are exactly the same effects that have been found with other non-gauge-invariant cut-off versions of electrodynamics [R. P. Feynman, Physical Rev. (2) 76, 769–789 (1949); these Rev. 11, 765].

F. J. Dyson (Princeton, N. J.)

HANUS, W.

On the -formalism of Kemmer and its quantization on the basis of Schwinger's variational principle. In English. p. 275, (ACTA PHYSICA POLONICA, Vol. 13, No. 4, 1954, Warsazawa, Poland)

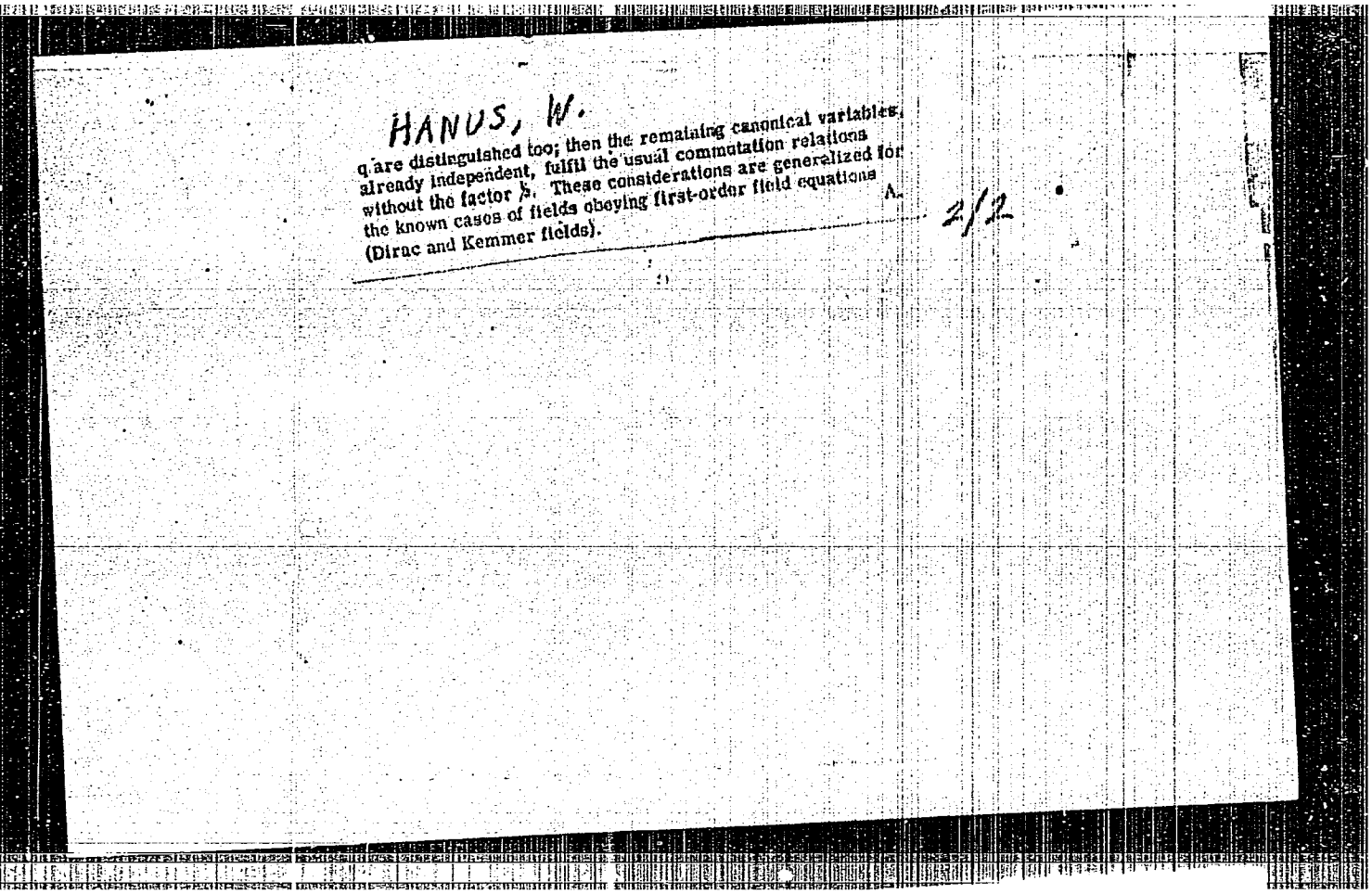
SO: Monthly List of East European Accessions, (EEAL), LC, Vol. 4, No. 5, May 1955, Uncl.

HANUS, W.

530.145

6339. HAMILTONIAN FORMALISM AND CANONICAL COMMUTATION RELATIONS IN THE CASE OF FIRST ORDER LAGRANGE EQUATIONS. W.Hanus.
Acta phys. Polon., Vol. 14, No. 4, 309-21 (1955).

The problem of the Hamiltonian formalism in the case of first-order equations of motion is investigated on a dynamical model with a finite number of degrees of freedom. The possibility is shown of introducing canonically conjugate variables to the generalized coordinates q_j by the usual definition $p_j = \partial L/\partial \dot{q}_j$, in spite of their dependence on q_j, provided that a suitable symmetrization is performed. The relations between the q's and p's are interpreted as a canonical transformation independent of time. The canonical quantization with the aid of the correspondence principle (exploiting the properties of the Poisson brackets) is proved to be possible in this case in spite of the mutual dependences of q and p. The correct canonical commutation relations with the factor ½ are obtained. The admissibility of treating the relations between the p's and q's as a canonical transformation is restricted to only one of the infinitely many Lagrangians giving the same equations of motion, i.e. differing by terms of the form of a time derivative, namely to the Lagrangian symmetrical with respect to integration by parts. This form of the Lagrange function (connected with the canonical commutation relations possessing a factor ½) is thus distinguished. Moreover, two other special forms allowing an immediate elimination of one half of the variables



HANUS, W.

q are distinguished too; then the remaining canonical variables, already independent, fulfil the usual commutation relations without the factor $\frac{1}{2}$. These considerations are generalized for the known cases of fields obeying first-order field equations (Dirac and Kemmer fields).

A. 2/2

Hanus, W

B-6

POLAND/Theoretical Physics

Abs Jour : Referat Zhur - Fizika, No 5, 1957, No 10921

Author : Hanus, W., Rayski, J.
Inst : O

Title : On the Mass Spectra for Bosons

Orig Pub : Acta phys. polon., 1956, 15, No 2, 117-122

Abstract : A study is made of the mass spectrum in the bilocal theory. For this purpose, the square of the mass m^2 is replaced in the bilocal equations of motion by the mass operator M^2. Introducing the mass operator should not disturb the compatibility of the equations of motion. This requirement leads to the condition for the determination of the mass spectrum: $\hat{M}^2\psi = m^2\psi$. Two possible choices of the operator M^2 are considered. It is proposed, that in one case the mass spectrum obtained corresponds to the family of π mesons, and in the second to the family of K mesons.

Card 1/2

POLAND/Theoretical Physics

Abs Jour : Referat Zhur - Fizika, No 5, 1957, No 10921 B-6

In both cases the mass m_n corresponds to a particle with spin $n\hbar$.
A brief comparison with experiment is given.

Card 2/2

HANUS, W.

On line strength relations in the doublet arc spectra of aluminium, gallium, indium and thallium. Bul Ac Pol mat 8 no.9:629-636 '60.

1. Department of Theoretical Physics, Nicolas Copernicus University, Torun. Presented by W. Rubinowicz.

(Spectrum analysis) (Aluminum) (Gallium)
(Indium) (Thallium)

HANUS, Wanda

On some problems of relative intensities in atomic spectra. Postepy fizyki no.3:275-287 '60.

1. Katedra Fizyki Teoretycznej, Uniwersy et Mikolaja Kopernika, Torun.

S/058/62/000/003/038/092
A061/A101

AUTHOR: Hanus, W.

TITLE: Relative doublet-line intensity in the principal series of cesium

PERIODICAL: Referativnyy zhurnal, Fizika, no. 3, 1962, 2, abstract 3V11 ("Bull. Acad. polon. sci. Sér. sci. math. astron. et phys.", 1961, v. 9, no. 4, 287 - 291, English; Russian summary)

TEXT: Using data available on oscillator strengths (f_n) and the Fermi formula, the relative doublet-line intensity $(S_2/S_1)_n$ was calculated for 13 lines of the principal series of cesium. The calculated $(S_2/S_1)_n$ values were compared with experimental data. The possible effect of errors in f_n on $(S_2/S_1)_n$ was evaluated. It is pointed out that the theoretical results seem to back Kratts's assumption that $(S_2/S_1)_n$ approaches a fairly high asymptotic value in the farthest lines of the series.

Ye. Pshenichnov

[Abstracter's note: Complete translation]

Card 1/1

HANUS,W.

On the role of the Sommerfeld and Darwin corrections in the central field problem. Bul. Ac. Pol. mat. 11 no.7:473-477 '63.

1. Department of Theoretical Physics, N.Copernicus University, Torun. Presented by A. Jablonski.

HANUS, W.

Discussion of the first order perturbation calculus formulae in connection with the problem of a correct transition from Dirac to Pauli theory. Bul Ac Pol mat 11 no.5:341-345 '63.

1. Department of Theoretical Physics, Nicholas Copernicus University, Torun. Presented by A. Jablonski.

HANUS, W.

The physical meaning of a nonunitary transforma tion connecting the Dirac and Pauli formalisms. Bul Ac Pol mat 12 no. 2:109-112 '64.

1. Department of Theoretical Physics, N. Copernicus University, Torun. Presented by A. Jablonski.

HANUS, Wanda

"Post-Pauli approximation" and its statistical interpretation.
Acta physica Pol 26 no.6:1181-1195 '64.

1. Department of Theoretical Physics of Nicholas Copernicus University, Torun. Submitted June 13, 1964.

HANUS, W.

Influence of exchange and polarizability effects on relative line strengths in atomic spectra. Bul Ac Pol math 13 no.1: 73-75 '65.

1. Department of Theoretical Physics of N.Copernicus University Torun. Submitted November 9, 1964.

HANUS, Z.

CZECHOSLOVAKIA / Physical Chemistry, Thermodynamics. Thermochemistry. Equilibria. Physico-Chemical Analysis, Phase Transitions. B

Abs Jour: Zhur-Khimiya, No 17, 1958, 56662.

Author : Tomiska Josef, Hanus Zdenek.
Inst : Not given.
Title : Calculation of Normal Boiling Points, Vapor Pressures and Critical Values of Monochloroparaffines.

* Orig Pub: Chem. listy., 1957, 51, No 6, 1014 - 1024.

Abstract: The authors have proposed empirical relationships. 1. The differences $T_2 - T$, of normal paraffine boiling points T, (°K), their primary monochlorine derivatives T_2 (°K) for substances with the same number of C atoms are practically identical (deviation $< 1^{\circ}$. More-

Card 1/4 5

* Abstracted in: Collection of Czechoslovakian Chemical Communications, 1958, Vol 23, No 2, p 174 - 190.

CZECHOSLOVAKIA / Physical Chemistry, Thermodynamics. Thermochemistry. Equilibria. Physico-Chemical Analysis, Phase Transitions. B

Abs Jour: Ref Zhur-Khimiya, No 17, 1958, 56662.

Abstract: over, should x be the number of carbon atoms in a molecule, then (at a pressure of 760 millimeters of the mercury column) $T_1 = 139.1 + 92.71\ g\ x + 234\ lg^2 x - 1.86\ x$ ($\pm 0.3^{\circ}$); $T_2 = 120.5 - 67.21\ g\ x - 12.61\ lg^2\ x + 0.92\ x + T_1 - a$, whereby a = 0 for primary chloroparaffines, a = 10.6 for secondary and a = 14.3 for tertiary ones. 2. The isomeric monochloride derivatives of a given paraffine of the same type are characterized by approximately the same boiling point (largest deviation 1.6°). 3. The boiling points of the secondary chloroparaffines lie approximately 10.6° lower, and the tertiary ones 14.3° lower than the

Card 2/4

CZECHOSLOVAKIA / Physical Chemistry, Thermodynamics. Thermochemistry. Equilibria. Physico-Chemical Analysis, Phase Transitions. B

Z/009/60/000/012/002/002
E073/E335

Calculation of Some Physical Constants of Monochloroparaffins

$$T_c = 120.5 - 67.2 \log x - 12.6 \log^2 x + 0.92 x + T_p - \alpha \quad (1)$$

where T_p - normal boiling point of the mother paraffin
α - constitution increment

for primary monochloroparaffin ... $\alpha = 0$
for secondary monochloroparaffin ... $\alpha = 10.6$
for tertiary monochloroparaffin ... $\alpha = 14.3$.

The probable error is 0.12 °C. The difference between calculated and measured values did not exceed 1.5 °C.
Vapour tension:

$$T = T_c \left(A - \frac{B}{\log p} \right) \quad (^\circ K) \quad (2)$$

Card 2/6

Z/009/60/000/012/002/002
E073/E335

Calculation of Some Physical Constants of Monochloroparaffins

$$\log p = C - \frac{BT_c}{T - AT_c} \quad \text{(mm Hg)} \qquad (3)$$

where A, B, and C are constants which are tabulated in the paper. For calculating the critical pressure the formula of Hougen and Watson (Ref. 1) can be used if the critical pressure of the mother paraffin is known; otherwise, the authors propose a modification of the Meissner relation. The critical volume is also calculated on the basis of the Meissner equation. The heat of evaporation is expressed by a slightly modified version of the Clausius-Clapeyron equation. For the density the following formula is proposed:

$$d_4^{20} = 0.906 - 0.023 \log x - 0.016 \log^2 x + \varepsilon \qquad (15)$$

Card 3/6

Z/009/60/000/012/002/002
E073/E335

Calculation of Some Physical Constants of Monochloroparaffins

where x is the number of carbon atoms in a molecule and
ε is the constitutional increment which is tabulated in the paper.

It is claimed that the results obtained by means of this formula are considerably more accurate than those obtained by the formulae of Scheibel and Benkö (Refs. 3, 11). For calculating the density at temperatures other than 20 °C the authors combined the empirical equation derived by Eötvös, Ramsay and Shields (Refs. 9, 12) with the empirical relation of Scheibel and Sugden (Refs. 3, 13). Thus, the following relation is obtained:

$$d_t = k^{0.3} \cdot M \frac{\left[t_k - (t + 6)\right]^{0.3}}{\left[P\right]^{1/2}} \qquad (18)$$

Card 4/6

Z/009/60/000/012/002/002
E073/E335

Calculation of Some Physical Constants of Monochloroparaffins

where t_k is the critical temperature, ^{o}C and
$[P]$ is a parachor.
More accurate results are obtained with the following equation:

$$d_t = d_a\left(\frac{t_k - (t + 6)}{t_k - (t_a + 6)}\right)^{0.3} \qquad (20).$$

This relation is valid for any nonassociated liquid. If the density d_a for any given temperature t_a is known and also the critical temperature, it is possible to calculate the density for any temperature in the entire temperature range of the liquid state. The refractive index is calculated by means of the Lorenz formula.

Card 5/6

Z/009/60/000/012/002/002
E073/E335

Calculation of Some Physical Constants of Monochloroparaffins

There are 2 figures, 7 tables and 19 references:
2 Czech and 17 non-Czech.

ASSOCIATION: Vojenská akademie A. Zápotockého, Brno
(Military Academy A. Zapotocký, Brno)

SUBMITTED: May 19, 1959

Card 6/6

HANUS, Zdenek, inz.

Determining the deformation of reinforced concrete ceiling in a factory hall. Geod kart obzor 8 no.1:13-15 Ja '62.

1. SG, Mlada Boleslav.

HANUSKA, ALEXANDER

"Kruhove dosky na pruznom polpriestore. Bratislava, Vydavatelstvo Slovenskej akademie vied, 1957. 75 p. (Slovenska akademis vied. Ustav stavebnictva a architektury. Prace, zosit 2) /Circular plates on an elastic half-space. German and Russian summaries. bibl., diagrs., footnotes, graphs, tables/"

p. 75 (Bratislava, Czechoslovakia)

Monthly Index of East European Accessions (EEAI) LC, Vol. 7, No. 6, June 1958.

HANUSKA, A.; BALAS, J.

Stress distribution in an infinite wedge. p. 7.

STAVEBNICKY CASOPIS. (Slovenska akademia vied) Bratislava, Czechoslovakia. Vol. 7, no. 1, 1959.

Monthly list of East European Accessions (EEAI) LC, Vol. 8, no. 10, Oct. 1959. Uncl.

HANUSKA, A.

"Beams on an elastic semispace. p. 73"

STAVEBNICKY CASOPIS. (Slovenska akademia vied) Bratislava, Czechoslovakia, Vol. 7, No. 2, 1959

Monthly List of East European Accessions (EEAI), LC, Vol. 8, No. 6 June 1959
Uncl.

R/008/60/000/003/005/007
A125/A026

24.4100

AUTHOR: Hanuska, Alexander

TITLE: On the Possibility of Applying Inherent Functions to the Calculation of Skew Quadrangular Plates

PERIODICAL: Studii şi Cercetări de Mecanică Aplicată, 1960, No. 3, pp. 675-680

TEXT: Subject article presents one of the possibilities for calculating irregular plates with arbitrary limit conditions. Inherent functions are used for the calculation. The author first examines a plate having a general quadrangular shape and arbitrary limit conditions. He selects the polar coordinates (Fig. 1) and obtains the expressions (1) and (2), in which the relations (3) are valid between the cartesian coordinates. He further considers the function (4) in which the function $w_{i,o}$ satisfies the equation (5), and the limit conditions along the AC and AD sides for i = 1, and along the BC and BD sides for i = 2. The functions $w_{i,n}$ represent the bi-harmonic function, arranged according to the absolute value of the λ_n root of the transcendental equation. This equation corresponds to the conditions of the homogeneous contours for a given support, i.e., for the two triangles having their apex in A and B. The function (4), however, does not satisfy the compatibility condition of the functions w_1 and w_2 in

Card 1/2

R/008/60/000/003/005/007
A125/A026

On the Possibility of Applying Inherent Functions to the Calculation of Skew Quadrangular Plates

the CD section, In this section, the conditions (6), (7), (8) and (9) have to be satisfied. For the solution of the four equations (6) - (9), there are four roots of the still undetermined constants $a_{1.n}$, $\bar{a}_{1.n}$, $a_{2.n}$ and $\bar{a}_{2.n}$. They can be determined by one of the approximation methods, after substituting the expression (4) in the equations (6), (7), (8) and (9). As an example of application, the author calculates a uniformly loaded plate, simply supported on all fours sides, having the shape and dimensions shown in Figure 2, and compares some results with the values indicated by Jensen (Ref. 5). This method can also be used for the solution of plane problems of the elasticity theory. There are 4 figures and 12 references: 5 Soviet, 1 Rumanian, 3 German, 2 English and 1 French.

ASSOCIATION: Slovenská Akadémiá Vied (Slovak Academy of Science) in Bratislava

SUBMITTED: November 18, 1959

Card 2/2

HANUSKA, Alexander

The bending of a wedge-shaped plate. Archiw mech 15 no. 2: 209-224 2 '63.

1. Institute of Building and Architecture, Slovak Academy of Sciences, Bratislava.

BALAS, Jan, inz., CSc.; HANUSKA, Alexander, inz., CSc.

Static solution of some types of nonrectangular plates.
Stav cas 12 no.1:64 '64.

HANUSKA, Alexander, inz. CSc.

Conference on the theory of plane and space structures.
Stav cas 12 no.3:198-199 '64.

1. Institute of Building and Architecture, Slovak Academy of Sciences, Bratislava.

HANUSKA, Alexander, inz. CSc.

Calculation of continuous skew plates. Stav cas 12 no.5: 294-301 '64.

1. Institute of Building and Architecture, Slovak Academy of Sciences, Bratislava.

HANUSKA, Alexander

Conference on the theory of plane and space structures.
Vestnik CSAV 73 no. 1: 95-97 '64.

HANUSKA, L.

"Hydrobiology in people's republics and in the USSR." (p.121). BIOLOGICKY SBORNIK. (Slovenska akademia vied a umeni) Bratislava. Vol. 7, No. 1/2, 1952.

SO: East European Accessions List, Vol 3, No 8, Aug 1954.

HANUSKA, L.

HANUSKA, L. Contemporary problems of the Czechoslovak hydrobiology. p.116.

Vol. 11, no. 2, 1956, BIOLOGIA, BRATISLAVA, CZECHOSLOVAKIA.

SO: Monthly List of East European Accessions, (EEAL), LC, Vol. 5, No. 10, Oct. 1956.

HANUSKA, L.

"Some interesting protozoa in the Danube. In German."

p. 53 (Biologia, Vol. 13, no. 1, 1958, Praha, Czechoslovakia)

Monthly Index of East European Accessions (EEAI) LC, Vol. 7, no. 9, September 1958

HAMUSKA, Ladislav

Protozoa in the Nitra river bed (Saprobial-ecological study).
Biologia 17 no.11:812-827 '62.

1. Hygienisch-epidemiologische Bezirksstation in Nove Zamky, Arbeitsstatte in Sturovo, Slowakei.
(PROTOZOA) (WATER MICROBIOLOGY)

CZECHOSLOVAKIA

L. HANUSKA [Affiliation not stated]

"Docent Rudolf Sramek-Husek, Dr. Sc."

Bratislava, Biologia, Vol 18, No 2, 1963; p 156.

Abstract: Brief sympathetic obituary of ornithologist - limnologist - hydrobiologist who died in June 1962 at age 55; review of his scientific and organizational activity.

1/1

SARO,S.; HANUSKOVA,M.

Spark alpha counter. Acta r nat Univ Com 9 no.6:39 ? '64.

1. Chair of Nuclear Physics of Comenius University, Bratislava, Smeralova 2A (for Sar

HANUSKOVA, M.

Problems in anesthesia in maxillofacial injuries. Acta chir. orthop. traum. cech. 29 no.6:543-546 D '62.

1. Klinika plastickej chirurgie Lekarskej fakulty Univerzity Komenskeho v Bratislave, prednosta doc. dr. St. Demjen.
(FACIAL INJURIES) (ANESTHESIA)

L 30916-66 EWI(m)/T
ACC NR: AP6022915 SOURCE CODE: CZ/0038/66/000/001/0021/0021

50
B

AUTHOR: Saro, Stefan; Hanuskova, Maria

ORG: Department of Nuclear Physics, Faculty of Natural Sciences, Comenius University, Bratislava (Katedra jadrovej fyziky PFUK)

TITLE: Scintillation counter of alpha particles 19

SOURCE: Jaderna energie, no. 1, 1966, 21

TOPIC TAGS: scintillation counter, alpha particle, oscillation

ABSTRACT: The article is an abstract of the authors' publication in Acta F.F.N. Univ. Comen. IX., 1, Physica, 1964. Properties of a counter designed for work in air at atmospheric pressures are discussed. Small differences in the distance of the electrodes from each other do not have a great influence on the accuracy of the counter. When the RH of the air decreased form 100% to 20% the efficiency of the counter decreased by 46%. The anode wire is subject to mechanical oscillation if the wire is too long with respect to its thickness. When the angle of impact of the alpha particles upon the cathode does not exceed 30° the results are not influenced by the angle of impact to a great extent. The efficiency with an increasing angle decreases, and at 90° is practically zero. [JPRS]

SUB CODE: 20 / SUBM DATE: none

Card 1/1 UDC: 539.12.074.27 539.128.4
0915 0991

HANUSOVA, J.

1

Biochemical oxygen demand. J. Chalupa, J. Hanušová, K. Kouřil, and J. Solar (Ústav hygieny, Prague) ~~Československá hyg., epidemiol., mikrobiol. imunol.~~ 3, 188-7(1954); cf. Ruchhof, *et al.*, *C.A.* 42, 6028*i*.—The older methods are criticized and interfering factors reviewed. A modified permanganate method is presented for a wider range of concns. with an accuracy of 70-95%. L. J. Urbánek

CZECH

Determination of sulfates in drinking and surface waters, Jan Čuta and Jarmila Hanušová (Ústav hyg., Prague), *Československ. hyg., epidemiol., mikrobiol., imunol.* 4, 101–5 (1956).—Modern volumetric methods with completon III and $Th(NO_3)_4$ are described and compared with the gravimetric detn. 14 references. L. J. Urbánek

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CZECHOSLOVAKIA

HANUSOVA, J; CUTA, J.

Institute of Hygiene (Ustav hygieny), Prague (for both)

Prague, Ceskoslovenska hygiena, No 9, 1963, pp 523-526

"Problems of Detergents in Hygiene. II. Nephelometric Estimation of Non-Ionic Saponates by Means of Iodomercurate."

[illegible]

[illegible]

Institute of Hygiene (Ustav hygieny), Prague (Czechoslovakia)

Prague, Ceskoslovenska Hygiena, No 8, 1957, pp 507-513

"Hygienic Problems of Chromates. II. The Harmful Effects of Chromic and Non-ionic Chromates."

LUKAVSKY, J.; HANUSOVA, S.; HORNSTEIN, Q.; WINTER, W.

Besnier-Boeck-Schaumann disease. Cas. lek. cesk. 96 no.1: 9-12 4 Jan 57.

1. Klinika nemoci vnitrnich Lekarske fakulty hygienicke Karlovy University. Prednosta prof. Dr. Vratislav Jonas. (for Lukavsky) 2. Klinika kozni lekarske fakulty hygienicke Karlovy University. Prednosta doc. Dr. Jan Konopik. (for Hanusova, Hornstein, Winter).

(SARCOIDOSIS, case reports
pulm. & extrapulm. localization (Cz))
(LUNG DISEASES, case reports
sarcoidosis (Cz))

WOLF, J.; HANUSOVA, S.

Occupational eczema with planar appearance. Cesk. derm. 36 no.2: 80-82 '61.

1. Histologicky ustav Karlovy university v Praze, prednosta akad. prof. Dr. J. Wolf Kozni oddeleni nemocnice v Praze VIII, prednosta doc. dr. J. Obrtel, dr. Sc.

(OCCUPATIONAL DERMATITIS pathol.) (ECZEMA pathol.)

HANUSOVA, Svetla

Lipoid parakeratotic granules. Cesk. derm. 36 no.7:456-464 '61.

1. Histologicky ustav Karlovy university, prednosta akademik prof. dr. J. Wolf Kozni oddeleni nemocnice Praha-Bulovka, prednosta doc. MUDr. J. Obrtel, Dr. Sc.

(KERATOSIS pathol)

HANUSOVA, V.

Relation of the cerebral cortex to internal organs. Prakt. lek., Praha 31 no. 11:237-240 8 June 1951. (CLML 22:3)

1. Of the Third Internal Clinic (Head--Prof. J. Charvat, M. D.

HANUSOVA, Vera Dr.

SUCHANOVA, Milada, Dr; UBLOVA, Milada, Dr; HANUSOVA, Vera, Dr.

Etiology of Reiter's syndrome. Cas.lek.cesk. 91 no.44:1250-1255 31 Oct 52.

1. Za technicke spoluprace M.Loukotove. Z Ustavu pro lekarskou mikrobiologii a imunologii K.U. Prednosta: prof.dr. Fr.Patocka. Z II. kozni kliniky SFN v Praze. Prednosta: prof. K.Hubschmann, Z III. interni klinikh SFN v Praze. Prednosta: prof. dr. J.Charvat.
(REITER'S DISEASE, etiology and pathogenesis)

MICHALOVA, C.; HANUSOVA, V.

Considerations on the higher nervous function and on various humoral aspects in workers exposed to trichloroethylene. Cas. lek. cesk. 95 no.42:1167-1172 19 Oct 56.

1. Ustav hygieny prace a chorob z povolani, Praha, red. prof. Dr. J. Teisinger, C. M., Praha 2, Karlovo nam. 33.

(TRICHLOROETHYLENE, effects,
on blood cholesterol & vitamin C & higher nervous funct. in workers (Cz))
(CHOLESTEROL, in blood,
eff. of trichloroethylene in workers (Cz))
(VITAMIN C, in blood,
same)
(CENTRAL NERVOUS SYSTEM, physiology,
eff. of trichloroethylene on higher nervous funct. in workers (Cz))

HANUSOVA, V.

CZECHOSLOVAKIA/Pharmacology Toxicology- Toxicology. U-9

Abs Jour : Ref Zhur - Biol., No 3, 1958, 13101

Author : Hanusova, V., Michalova, C.
Inst :
Title : Changes in Higher Nervous Activity and Certain Humoral Factors due to Contact with Lead.

Orig Pub : Casop. lekaru ceskych, 1956, 95, No 52, 1409-1412.

Abstract : Higher nervous activity was studied by a method of conditioned reflexes and by blood ascorbic acid and cholesterol levels in typographers with 10 to 30 years of experience and in workers hospitalized because of lead poisoning who had been working with lead for 1 to 10 years. A number of higher nervous activity disorders were found (fatiguability, especially on the part of the second signaling system, weakened inhibitory processes in the first and second signaling systems, increased latent period during the association test). The changes in higher nervous activity

Card 1/2

SIROKY, A.; KREJCOVA, H.; SLAVICEK, J.; HANUSOVA, V.

The irritability threshold of the vestibular apparatus in children and adults. Sborn. lek. 67 no.3:94-100 Mr'65.

1. Neurologicka klinika fakulty vseobecneho lekarstvi University Karlovy v Praze (prednosta: akademik K. Henner); Fyziologicky ustav fakulty vseobecneho lekarstvi University Karlovy v Praze (prednosta: prof. dr. F. Karasek, DrSc.) a Ustav hygieny prace a chorob z povolani v Praze (prednosta: prof. dr. J. Teissinger, DrSc.).

RADA, B.; BLASKOVIC, D.; technical assistance: HANUSOVSKA, T.

Inhibition of vaccinia virus multiplication in vitro by 6-azauracil riboside. Acta virol.Engl.Ed.Praha 5 no.5:308-316 S '61.

1. Institute of Virology, Czechoslovak Academy of Sciences, Bratislava.

(VACCINIA virol)
(NUCLEOSIDES AND NUCLEOTIDES pharmacol)

HANUSZ, Andras, fomernok

Trends in the manufacture of loading and assembling cranes.
Gep 15 no.12:478-482 D '63.

1. Magyar Hajo- es Darugyar Daru Gyaregyseg.

HANUSZ, TADEUSZ

FEAE I BOOK EXPLOITATION POL/A22A

Mała energetyka; biuletyn, Nr 2 (Low-Capacity Power Engineering; Bulletin, No. 2). Kraków, Towarzystwo Rozwoju Małych Systemów Energetycznych w Polsce, 1958. 131 p. 3,000 copies printed.

No editor mentioned.

PURPOSE: This bulletin is intended for power engineers and technicians specializing in the development of low-capacity natural resources and for users of such power resources for local agricultural and industrial applications.

CONTENTS: This collection of articles is devoted to the problems of the utilization for local consumption of regional power resources other than coal and oil. Such energy resources include water, wind, tides, natural and waste gases, peat, shale, hot springs and others less known or as yet unexplored. The study of such resources and of their use is presented in a series of articles concerning achievements and experience in Poland and other countries. There is a detailed bibliography, largely of non-Soviet and non-Polish source material, at the end of the book. No personalities are mentioned.

AVAILABLE: Library of Congress

Card 6/6

JP/lwb/mm
9-16-60

P/007/60/000/021/001/002
A076/A126

3,2100

AUTHOR: Hanusz, Tadeusz, Master of Engineering

TITLE: A device for measuring the speed of experimental rockets by photography

PERIODICAL: Skrzydlata polska, no. 21, 1960, 7

TEXT: The article describes a new method and a device for measuring the speed of the RM-2A experimental rocket. The basic principle of this method is to photograph the rocket trail left by a chemical substance, in a mirror vibrated by a contact breaker which is powered by a 4.5 v battery. There is 1 photograph.

Card ~~1/2~~

JASINSKA, St.; LINK, F.; BLASKOVIC, D.; RADA, B.; Technical assistance: RAUS, J.; HANUSOVSKA, T.

Studies on the effect of antiviral substances on experimental virus infections. III. The effects of 6-azauracil riboside and urethane on vaccinia virus infection in mice. Acta virol. (Praha)[Eng]6 no.1: 17-23 Ja '62.

1. Institute of Virology, Czechoslovak Academy of Sciences, Bratislava.

(VACCINIA virol) (URETHANE pharmacol)
(NUCLEOSIDES AND NUCLEOTIDES pharmacol)

VILCEK, J.; RADA, B.; Technical assistance: TOVARYSOVA, H.; HANUSOVSKA, T.

Studies on an interferon from tick-borne encephalitis virus-infected cells (IF). III. Antiviral action of IF. Acta virol. (Praha)[Eng]6 no.1:9-16 Ja '62.

(ENCEPHALITIS EPIDEMIC virol)

TRZASKOWSKI, Stanislaw; KUZMA, Waclaw; HANUSZKIEWICZ, Henryk

Right diaphragmatic hernia. Polski przegl. radiol. 20 no.1: 37-40 Jan-Feb 56.

1. Z Zakladu Radiologii A M w Lodzi. Kier. doc. dr. W. Trzetrzewinski z III Kliniki Chirur. A M w Lodzi, Kier. prof dr. W. Tomaszewicz i z Pracowni Radiolog. Szpitala Miejskiego w Kutnie Dyrektor dr. J. Perkowicz.Stanislaw Trzaskowski, Lodz, ul. Zielona 17 m. 5. Waclaw Kuzma, Lodz, ul. Narutowicza 42. Henryk Hanuszkiewicz, Lodz, ul. Kopcinskiego 22.
(HERNIA, DIAPHRAGMATIC, case reports.
(Pol))

HANUSZKIEWICZ, Henryk; TORZECKI, Zenon

Postoperative histopathological lesions of adrenal glands in thromboangiitis obliterans. Polskie arch.med. wewn. 28 no.5:706-710 1958.

1. Z III Kliniki Chirurgicznej A.M. w Lodzi Kierownik: prof. dr med. W. Tomaszewicz i z Zakladu Anatomii Patologicznej A.M. w Lodzi Kierownik: prof. dr med. A. Pruszczynski. Adres autora: Lodz, ul. Prochnika 9.

(THROBOANGIITIS OBLITERANS, surgery,
adrenalectomy, postop, residula adrenal histopathol. (Pol))
(ADRENAL GLANDS,
histopathol. in thromboangiitis obliterans (Pol))
(ADRENALECTOMY, in var dis.
thrombaongiitis obliterans, postop. residual adrenal sitopathol. (Pol))

HARVAL, Pal

Problems of up-to-date dwelling construction and interior decoration in Czechoslovakia. Faipar 11 no.9:274-276 S '61.

HANYGA, Waclaw, mgr inz.

Development prospects of the automobile industry in Poland.
Techn motor 13 no. 7: 209-216 Jl '63.

1. Stowarzyszenie Inzynierow i Techników Mechanikow Polskich, Warszawa.

HANYGA, Waclaw, mgr inz.

Concentration and specialization of production in the motorization industry. Przegl techn 84 no.47:5 24 N '63.

HANYGA, Waclaw, mgr inz.

Production of automobiles in the USA. Przegl techn 85 no.38:7 20 S '64.

HANYK, J.

"Electrification of the Czechoslovak State Railroads and the New Electric Locomotive Bo'Bo'." p. 178 (STROJIRENSTVI, Vol. 3, No. 3, March 1953, Praha, Czechoslovakia).

SO: Monthly List of East European Accessions, LC, Vol. 3, No. 5, May 1954, Unclassified

HANYK, J.

"The Electrification of Railroads as a New Epoch in the History of Czechoslovak Railroads." p. 203
"The Heroic Fight of Korean Railroad Men." p. 206 (Zeleznice, Vol. 3, no. 9, 1953, Praha)

SO: Monthly List of East European Accessions, Vol. 3, No. 3 Library of Congress, March 1954, Uncl.

HANYK, J.; JANSA, F.

Electrification of the Czechoslovak railways. p. 452.

ELEKTROTECHNICKY OBZOR. Praha, Czechoslovakia, Vol. 44, No. 9, Sept. 1955.

Monthly list of East European Accessions, (EEAI) LC, Vol. 8, No. 10, Oct. 1959.
Uncl.

HANYK, J.; JANSA, F.

Electric locomotives. p. 508.

Vol. 44, no. 10, Oct. 1955
ELEKTROTECHNICKY OBZOR
Praha, Czechoslovakia

Source: East European Accession List. Library of Congress
Vol. 5, No. 8, August 1956

HANYK, J.

A comparison of the electrification cost of railroads in using 25-kv., 50-cycle alternating current and 3000-volt direct current.

p. 54 (Zeleznicni Technika. Vol. 5, no. 2, Feb. 1957. Praha, Czechoslovakia)

Monthly Index of East European Accessions (EEAI) LC. Vol. 7, no. 2, February 1958

HANYK, J.

Electric traction on F..nch railroads.

P. 97, (Zeleznicni Technika) Vol. 5, No. 4, Apr. 1957, Czechoslovakia

SO: MONTHLY INDEX OF EAST EUROPEAN ACCESSIONS (EEAI) LC. - VOL. 7, NO. 1, JAN. 1958

HANYKOVA, M.

Determining the content of sulphur, sulphur dioxide and sulphur trioxide in combustion gases. Paliva 42 no.6:174-175 Je '62.

1. Ustav pro vyzkum paliv, Bechovice.

HANYKYR, Vladimir

Formation of anorthite by reactions in solid state. Sbor chem tech no.3, part 1:383-395 '59.

1. Katedra technologie silikatu, Vysoka skola chemicko-technologicka, Praha.

MATVEJEV, German Michajlovic; HANYKYR, Vladimir

Approximate determination of thermodynamic properties of some compounds of $CaO - Al_2O_3 - SiO_2$ system and the thermodynamic analysis of their origin. Sbor chem tech no.3, part 1:397-404 '59.

1. Katedra technologie silikatu, Vysoka skola chemicko-technologicka, Praha.

L 35440-65 EPF(n)-2/EPA(s)-2/EPA(w)/EWP(k)/EWT(m)/EWP(b)/EWP(e)/EWP(t)
Pf-4/Pt-10/Pu-4/Pab-10 IJP(c) WH/JD Z/0012/65/000/001/0025/0033

ACCESSION NR: AP5007770

AUTHOR: Tyrolerova, P. (Member of silicate technology dept); Vrbacky, I.; Hanykyr, V. (Member of silicate technology dept)

TITLE: Effect of calcinating barium titanyl oxalate on the properties of $BaTiO_3$

SOURCE: Silikaty, no. 1, 1965, 25-33

TOPIC TAGS: barium titanyl oxalate, calcination, barium titanate, titanium oxalate, barium oxalate, sintered titanate

ABSTRACT: In order to study the effects of heat and rapidly rising temperatures on the properties of $BaTiO_3$ produced by pyrolysis of barium titanyl oxalate, $BaTiO(C_2O_4)\cdot 4H_2O$, many samples of the oxalate were placed in crucibles in furnaces heated 50C above the calcination temperature for three hours. After testing at temperatures of 650, 750, 850, 950, 1050 and 1150C in silite laboratory furnaces, tests were made at temperatures increasing at the rate of 3C per minute and also at 10C/min. The product was a clean white powder without any discernible crystalline character. Samples were suspended in water and examined under a TESLA BS 242 electron microscope, which established particle sizes ranging from 0.1 μ at lower temperatures to 1.4 μ at 1150C. Each grade of powder was then compressed in a hydraulic press under 1400 kp/cm² into tablets and tested for strength.

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ACCESSION NR: AP5007770

which tended to decline in calcinates produced at higher temperatures. Six tablets from each grade were then sintered in a horizontal tube furnace with the temperature increasing by 600C per hour to 1325, 1350 and 1375C, where it was maintained for 15 and for 180 minutes. At the contact surfaces the tablets became slightly gray to yellow-gray and the exposed surfaces became gray to blue-gray, depending on the temperature and length of sintering. They were then tested for water absorption in a vacuum and their volumetric weight recorded in order to determine their density after compression. None of the samples proved completely non-absorptive, but those prepared at 900-950C had the lowest porosity, i.e., the highest sinterability. One explanation for this effect is that grain size increases with increasing heat and that a suitable particle size facilitates increased density under compression, but the fact remains that $BaTiO_3$ produced at 900-950C is most sinterable and that the rate of temperature increase affects its density. Orig. art. has: 4 figures and 3 tables.

ASSOCIATION: Katedra technologie silikatu, VSCHT, Prague (Silicate technology department, VSCHT)

SUBMITTED: 05Aug65 ENCL: 00 SUB CODE: MT, IC

NO REF SOV: 001 OTHER: 006

Card 2/2

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Z/012/61/000/003/002/004
E112/E435

AUTHORS: Ledvina, František and Hanykýř, Vladimír

TITLE: New ceramics with a low loss and low coefficient of thermal expansion

PERIODICAL: Silikáty, 1961, No.3, pp.220-227

TEXT: Ceramics, based on kaolinite and the carbonates of the alkaline earth metals, are becoming increasingly important insulating materials for operation under conditions of rapidly changing thermal stresses. The best known products are based on anorthite ($CaO.Al_2O_3.2SiO_2$), celsian ($BaO.Al_2O_3.2SiO_2$) and the alkali-free porcelains, containing alkaline earth carbonates as fluxes. The materials show generally good dielectric properties, plasticity and excellent resistance to temperature changes. Firing characteristics are, however, not completely satisfactory owing to the relatively narrow range of sintering temperatures. Sintering characteristics can be improved by replacing part of the calcium in anorthite by barium or strontium carbonate. One of the latest developments is an anorthite material of the following composition: 65% kaolinite, 23% $CaCO_3$, 2% wollastonite and

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E112/E435

New ceramics ...

10% $CaZrSiO_5$. A satisfactory celsian material has been previously prepared in Czechoslovakia but the preparation of anorthites has not yet been attempted. This gap has now been filled and the present paper describes the production not only of anorthite but also of celsian and mixtures of both components with the view of improving firing characteristics. The following procedure was adopted for the production of the synthetic materials: part of the required $CaCO_3$ or $BaCO_3$ was calcined in equimolar proportions with kaolinite so as to ensure formation of the desired minerals. The course of the reaction was followed by titration; the preformed minerals were then introduced into the rest of the mass, which was calcined at 1320°C for two hours. Composition of raw materials:

Anorthite mass		Celsian mass	
Anorthite precalcinate	25%	Celsian precalcinate	25%
$CaCO_3$	23%	$BaBO_3$	30%
Kaolin + clay	37%	Kaolin + clay	30%
Zirconium	15%	Zirconium	15%

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E112/E435

New ceramics ...

The different masses were studied by differential thermal analysis. Differential-thermal curves are reproduced in Fig.1. The suitable firing temperature was determined on cylindrical test specimens by heating them in an electric oven and measuring the interaction of temperature and shrinkage. The sintering range is defined as temperature range within which the shrinkage of the sample remains constant. The following other physical constants were determined: 1. specific gravity; 2. compressive strength; 3. bending strength; 4. coefficient of thermal expansion; 5. tan δ at 1 Mc/s, 20°C; 6. dielectric constant at 1 Mc/s; 7. thermal capacitance coefficient at 10 Mc/s, 20 - 80°C; 8. resistance at 50 cps at 20°C; 9. electric strength at 50 cps. Best results were obtained with a mixed material, consisting of 30% of the anorthite and 70% of the celsian mass. This material proved superior in its electric and mechanical properties to the pure celsian mass. In addition, it has a considerably lower firing temperature and a sufficiently wide sintering range. Its properties are: compression strength = 4700 kg/cm^2; bending strength, 660 kg/cm^2; thermal expansion coefficient = 3.0 (20 to

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